One-stop RFID solutions

*Wireless payment systems, drug recall, brand authentication etc.*
One-stop RFID solutions

Make your product intelligent with RFID and NFC technology

**RFID (Radio Frequency IDentification)** is not only a bar code but a fast emerging commercial technology used in many applications to enable wireless functions.

Using RF you can benefit from many new features. Remote control, tracking and alarm systems, transportation and mobile sensor system control are all functionalities that make tomorrow’s products more intelligent and competitive.

With the use of our intelligent RFID and NFC (Near Field Communication) chips, we would like to make all this available to you. DELTA has developed a standard component solution that is ready to everybody.

**Combine your ideas with our standard solution**

A special DELTA RFID design team has today created many different solutions that include both hardware and software. This puts us in a position to tailor your specific needs while piggy-backing on our standard solutions combined with our vast experience.

DELTA has created tailor-made microchips and software solutions for more than 25 years and has a record for right-first-time design using our own RFID and sensor libraries.

**Everything in one place**

As DELTA’s business interest and success are focused on volume deliveries to our customers, we are very dedicated to implement solutions as fast as possible.

The DELTA standard solution is a 8 mm² chip including software macro-drivers. These macros are used to create customised RFID systems.

DELTA has interface to special RFID-foundries which enable us to drive cost to a minimum. For our RFID-solutions we use 0.18 µm CMOS technology and a suite of Cadence tools.

Our skilled test engineers and our in-house test facility make it possible to run parallel test of as much as 256,000 chips/hour. Our contact to advanced packaging houses ensures our customers a one-stop solution.

If a company needs a customised chip, we can design, verify and make prototypes within 6 - 7 months. Add two more months to ramp to production.

Thus, our knowledge is extensive and our core competence within the RFID technology is based on analog front-end standards.

**About DELTA**

Since 1984, DELTA has been designing ASICs (Application Specific Integrated Circuit) and SoCs (System on Chip). DELTA is one of the largest and most experienced design houses in Northern Europe with a team of 16 ASIC designers.

**Cases**

CYPAK – Imagine intelligent packaging that reminds you to take a pill and stores your feedback. Just think of the possibilities… At the heart of Cypak’s technology is a small chip, designed specifically for Cypak and produced by DELTA.

RFIDsec – As RFID technology becomes more sophisticated the risk for intrusion of your privacy also increases. Together with DELTA, RFIDsec has developed a new encryption technology that prevents intrusion.

**Tell me more**

Contact us at tel. +45 72 19 40 40 or mail asic@delta.dk

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- Wireless payment systems
- Drug recall
- Brand authentication
Optional features
- 8, 10, 16 bit ADC
- CPU-based architecture
- Powered by field or battery
- DES/3DES/AES encryption
- Non-volatile memory (EEPROM, flash, OTP)
- General purpose I/Os for analog measurements
- Supports relevant protocols with hardware supported modulation/demodulation

Interfaces
- Read/Write RFID IC with I²C Interface
- UART
- I²C
- HDLC controller (DSRC)
- USB 1.1 core
- SPI
- RS232

Standards
- ISO 14443 type A / NFC, short range
- ISO 15693, short range
- ISO 18000-6C / EPC GEN2, long range

Project flow
1. Choose the IP blocks you need and add customised features if necessary — 3 months
2. Customer verification — proof-of-concept — by means of a PCB with the analog front-end and a FPGA. Final acceptance from customer — 2 months
3. Tape-out and prototypes — 2 months
4. Ramp to production and delivery of tested chips — 2 months

Firmware
- EPC 1800 GEN2
- Unique identifier
- Proprietary

Long range or short range
- Range from near field ( < 10 cm) to 10 m in HF (13.56 MHz) or 900 MHz UHF solution

Parameters
- Temp.: -20°C - 85°C
- Resolution: 10 bit
- Technology: 0.18 µm
- Die size: 1 - 8 mm²

Personal identification
Shipment route tracing
Temperature monitoring

One-stop RFID solutions
### Digital IPs

**Processors**
- V8/8051/PIC 8 bit RISC microcontrollers
- OpenMSP430
- 32 bit LEON processor core
- ARM7 TDMI
- ARM Cortex-M0

**Co-processors**
- DES/3DES processor
- AES encryption
- SHA-1 hashing

**RFID area**
- 14443 type A modulator/demodulator
- 15693 modulator/demodulator
- 18000-6C/ EPC GEN2

**Interfaces**
- Read/Write RFID IC with I²C Interface
- UART,
- I²C core
- HDLC controller (DSRC)
- USB 1.1 core
- SPI

**Memories**
- ROM, SRAM
- OTP (0.5 µm)
- EEPROM (0.25 µm, 0.18 µm)
- Flash (0.18 µm)

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### Analog IPs

**Power management**
- Bandgap ref.
- ULP Voltage regulator
- Voltage reg. (LDO)
- POR and Brown Out Detectors

**RFID interfaces**
- RFID 14443 type A /15693 analog front-ends (multistandard support)
- UHF EPC front-end

**Oscillators and PLLs**
- PLL (32 kHz–4/12/16 MHz)
- ULP RC osc. (from 32 kHz to 16 MHz), trimmable and programmable
- ULP XTAL OSC (< 1 µA)

**Signal conditioning**
- ADC 8 - 10 bit, SAR
- DAC 8 - 10 bit
- Sigma-Delta ADC 16 bit
- Bandgap ref.
- Amplifiers (instrumentation, transconductance, differential)
- Comparators
- Switch CAP amplifiers with offset compensation

**Sensors**
- Temperature
- Photo diode

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### Sample block diagramme of RFID system (delivered to customer)

![Sample block diagramme of RFID system](image_url)